

MAGNETORHEOLOGICAL NANOCOMPOSITE ELASTOMER FOR RELEASABLE ATTACHMENT APPLICATIONS

ABSTRACT

A releasable fastener system comprises a loop portion and a hook portion. The loop portion includes a support and a loop material disposed on one side thereof whereas the hook portion includes a support and a plurality of closely spaced upstanding hook elements extending from one side thereof. When the hook portion and loop portion are pressed together they interlock to form a releasable engagement. The resulting joint created by the engagement is relatively resistant to shear and pull forces and weak in peel strength forces. The hook elements are formed of a magnetorheological elastomer that provides a change in shape orientation and/or flexural modulus of the hook elements. In this manner, the shape orientation and/or flexural modulus of the hook elements can be remotely changed to provide a reduction or magnification in the shear and/or pull-off forces in addition to providing variable damping capabilities to the fastener system.